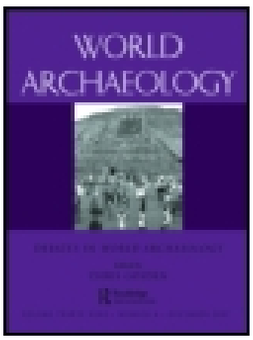
Cultic resilience and inter-city engagement at the dawn of urban history: protohistoric Mesopotamia and the 'city seals', 3200-2750 BC



World Archaeology

ISSN: 0043-8243 (Print) 1470-1375 (Online) Journal homepage: https://www.tandfonline.com/loi/rwar20

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To cite this article: Roger Matthews & Amy Richardson (2019): Cultic resilience and inter-city engagement at the dawn of urban history: protohistoric Mesopotamia and the 'city seals', 3200–2750 BC, World Archaeology, DOI: 10.1080/00438243.2019.1592018

To link to this article: https://doi.org/10.1080/00438243.2019.1592018

Published online: 24 Apr 2019.

WORLD ARCHAEOLOGY
https://doi.org/10.1080/00438243.2019.1592018

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Cultic resilience and inter-city engagement at the dawn of urban history: protohistoric Mesopotamia and the 'city seals', 3200–2750 BC

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ABSTRACT

Within the context of early urbanism, elite groups developed the world's earliest writing in Mesopotamia, 3200–2750 BC, comprising administrative documents in the form of inscribed clay tablets. How did these proto-literate urban communities engage with each other and what strategies did they employ to address major challenges to their survival? The 'city seal' evidence survives as seal impressions on clay bureaucratic artefacts, both inscribed tablets and impressed sealings. These impressions feature signs representing the names of Mesopotamian cities, many of them identifiable with known sites. The documents stand at the threshold of history, as the earliest evidence for inter-city engagement. Using an innovative methodology and interpretive framework of cultic resilience, the authors integrate archaeometric, iconographic and functional analyses of the earliest stages of writing and sealing, to argue that the city seal evidence provides unique insights into inter-city cooperation by Mesopotamian cities during a critical episode of early urban development.

KEYWORDS

Proto-cuneiform; tablets; sealings; pXRF; iconography; bureaucracy

Introduction: resilience in Mesopotamian protohistory

Urban communities in southern Iraq, Lower Mesopotamia, developed the world's earliest writing system by 3200 BC (Englund 1998). They wrote on clay tablets using a stylus to inscribe signs in the cuneiform script, employed for a divergent range of languages across Southwest Asia for 3000 years. Early urban communities of Mesopotamia also used cylinder seals, often integrated with inscribed documents, as mechanisms of administration within a bureaucracy exercising control over land allocation, labour gangs, animal flocks, and agricultural and craft products. The earliest Mesopotamian writing comprises exclusively administrative documents and lexical lists (Nissen, Damerow, and Englund 1993; Overmann 2016). Legal documents, letters, historiographic texts and royal inscriptions subsequently appear throughout the third millennium BC (Van De Mieroop 1999, Table 2).

We focus on the earliest stage of writing, characterised as 'proto-cuneiform' and, by extension, 'protohistoric', chronologically covering the Mesopotamian archaeological periods of terminal Late Uruk (Uruk IV), Jemdet Nasr (Uruk III) and Early Dynastic I, in total 3200–2750 BC. But the distribution of cuneiform literacy within Mesopotamian societies was always variable, with sectors of society often absent from the written record (Velduis 2011). Characterizing the earliest stage of cuneiform writing as protohistoric is based on the opaqueness of the textual content of the period 3200–2750 BC as much as on the scope of the texts. Most proto-cuneiform texts have been

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excavated in association with architectural structures widely interpreted as temples, from a few sites in Lower Mesopotamia including Uruk, Jemdet Nasr, Ur and Uqair. The relationship suggests that early writing was connected with the development of hierarchical socio-political structures as attested in the Eanna cultic precinct at Uruk, the world's 'first city' (Liverani 2006) and source of the vast majority of recovered proto-cuneiform tablets and sealed clay documents.

Employing new approaches in an integrated methodology, we interrogate a form of evidence occurring exclusively in the proto-cuneiform phase of Mesopotamian writing: the 'city seal' evidence (Figure 1; Matthews 1993), which survives as seal impressions made by cylinder seals on clay bureaucratic artefacts, both inscribed tablets and impressed sealings. These impressions feature signs representing the names of Mesopotamian cities, many of which we can identify with archaeological sites (Table 1). The documents stand at the threshold of history as they attest a form of historical reality involving Mesopotamian cities acting together. The earliest proto-cuneiform texts, of late fourth millennium BC date, are so laconic in their expression as to defy attempts to associate them with a single spoken language (Englund 1998), although Sumerian is the likeliest candidate. In these early texts, writing was used sparingly without concern to elaborate on, or even to mention, matters of common knowledge, which makes them truly protohistoric and difficult to understand. In this regard, the strongly visual nature of the signs carved into the city

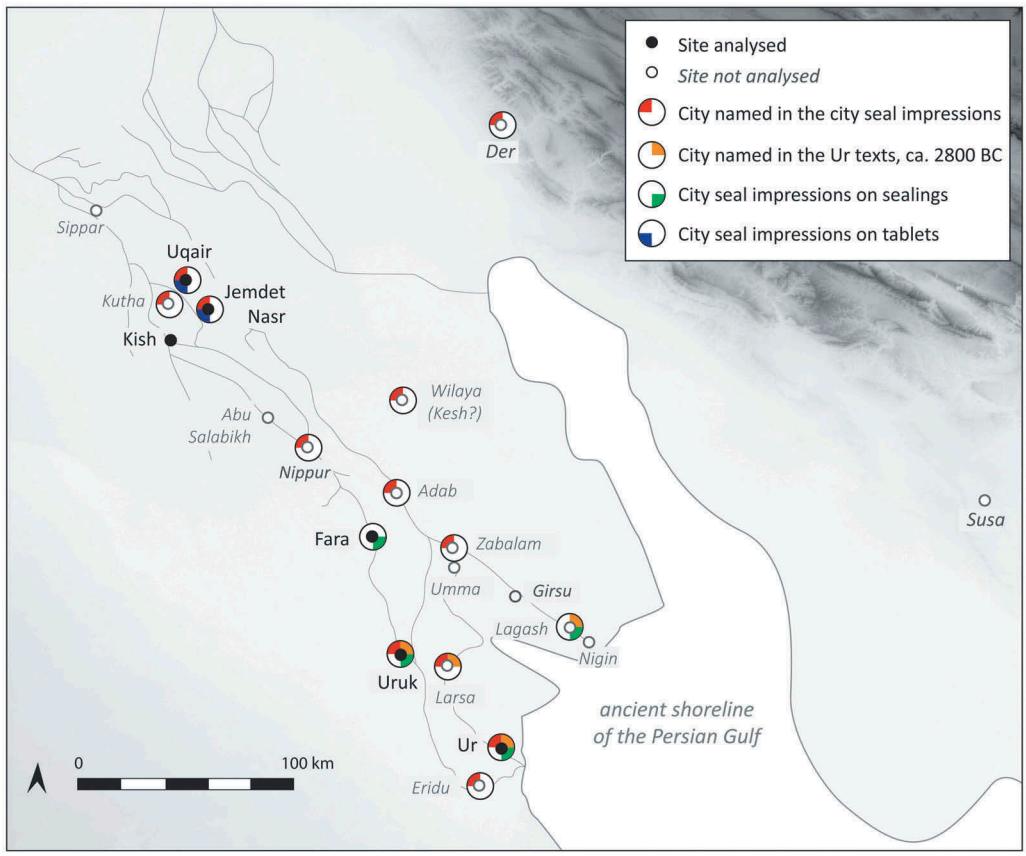

Figure 1. Map of Lower Mesopotamia with ancient river courses, showing cities featured in the city seal evidence (after Benati [2015, Figure 6], with authors' additions).

Table 1. Summary of Uruk III and Early Dynastic I city seal evidence.

Ancient site name	Modern site name	Attested in Uruk IV texts	Attested in Uruk III texts	Attested in Jemdet Nasr city seal	Attested in Uruk-Warka city seal	Attested in Archaic City List	Attested in Ur ED1 sealings	City seal impressions on tablets at site	City seal impressions on sealing at site
Ur	Muqayyar	x	x	x	x	x	x		x
Nippur	Niffar			x	x	x	x		
Larsa	Senkereh	x	x	x	x	x	x		
Uruk	Warka	x	x	x	x	x	x		x
Keš	Wilayah?			x	x	?	x		
Zabala	Ibzaikh		x	x		?			
Ereš	Abu Salabikh?			?		?			
UR_2 KU_6 RAD	Uqair?			x		x	?	x	
BU BU NA_2	?			x		x			
Kutha	Ibrahim			?					
UB	Jemdet Nasr?						x	x	
Šuruppak	Fara		x						x
Eridu	Abu Shahrain						x		
Adab	Bismaya	x	x				x		
Edinnu	?				x		x		
Kiš	Ingharra		x						
Der	Aqar						x		

seals' surfaces betokens a concern with legibility by parties involved in the sealing activities. The major significance of seals as vehicles of proto-historic experimentation is underlined by the fact that individual pictographs were cut into the seals' surfaces so as to be readable as 'signs whose semantic meaning could be understood independently of language' (Overmann 2016, 292). As Overmann (2016, 293) highlights, the independent development of true scripts, associable with specific languages, and literacy appears to have occurred solely in the context of state-level bureaucracies, such as those attested in Mesopotamia, Egypt, China and Mesoamerica. The city seal evidence is thus chronologically situated at a critical juncture in the protohistoric development of Mesopotamian writing within the context of pristine state development.

Our interpretive framework is that of societal resilience, whereby we analyse evidence from protohistoric Mesopotamian cities to investigate their attempts to thrive through a period of disruption including climate aridification at *c*.3100 BC (Brooks 2006; Staubwasser and Weiss 2006). The concept of resilience has been applied in the study of Mesopotamia, but with a focus on agricultural fragility as underpinning political expansion and contraction (Adams 1978; Pournelle and Algaze 2014). We shift the emphasis to a consideration of collaborative cultic practices as a strategy of societal resilience, in an investigation of 'how societies remember' (Connerton 1989) through recursive engagement in shared cultic ceremonies. Our argument is that it was through such cooperative cultic interaction that Mesopotamian cities were able to sustain themselves in the face of significant internal and external challenges.

Methods: integrated archaeometry, iconography and functional analysis

Our portable x-ray fluorescence (pXRF) analysis of clay tablets and sealings seeks to characterise differences between clays within the Lower Tigris-Euphrates river system, to examine administrative practices and the mobility of bureaucratic objects within and between Mesopotamian cities. Portable XRF does not offer the geochemical resolution of sampling approaches traditionally employed to identify the provenance of ceramics, but provides a non-destructive approach for effective characterization of distinctive clay groups. Using a Niton XL3t GOLDD+ analyser, we have

Table 2. Summary of clay objects analysed with pXRF.

Site name	Date (approx.)	Museum	Object	Qty
Jemdet Nasr	3100–2900 BC	Ashmolean Museum	Tablets	115
Jemdet Nasr	3100–2900 BC	Ashmolean Museum	Sealing	1
Uncertain provenance	3100–2900 BC	Ashmolean Museum	Tablets	3
Uruk	3100–2900 BC	Vorderasiatisches Museum	Sealings	30
Uruk	3100–2900 BC	Vorderasiatisches Museum	Tablets	4
Uncertain provenance	3100–2900 BC	Vorderasiatisches Museum	Tablets	33
Uncertain provenance	3100–2900 BC	British Museum	Tablets	8
Ur	2900–2750 BC	British Museum	Sealings	80
Fara	2900–2750 BC	Vorderasiatisches Museum	Sealings	53
			TOTAL	327

analysed objects in the Ashmolean Museum, Oxford, the British Museum, London, and the Vorderasiatisches Museum, Berlin (Table 2). The elemental composition for 26 elements was calibrated using standard geological samples and scrutinised using linear discriminant analysis. The results are integrated with iconographic and functional analyses of administrative documents to arrive at new interpretations of the city seal evidence.

Previous archaeometric approaches to clay administrative objects have explored mobility between urban centres of ancient Southwest Asia. Blackman's (1999) analysis of sealing clays at Hacınebi in southeast Turkey suggests that some sealings arrived at Hacınebi affixed to objects from southwest Iran, 1100 km distant, a pattern also identified in sealings from Tell Brak, Syria (Pittman and Blackman 2016). By contrast, Daszkiewicz, van Ess, and Schneider's (2012) analysis of clay items from Uruk suggests they were made of local clays. Goren, Finkelstein, and Na'aman's (2004, 2011) study of clay tablets from Hattusa in Turkey and el-Amarna in Egypt established the validity of using pXRF to characterize geographical groupings of clays used for cuneiform tablets. Work by Uchida on cuneiform tablets from Iraq and Turkey distinguished four groups of clays, based on principal components analysis of selected elements, with an emphasis on variation in calcium content as caused by local geology (Uchida, Niikuma, and Watanabe 2015; Uchida, Sasaki, and Watanabe 2011). These groups were defined as Lower Tigris-Euphrates River, Upper Tigris-Euphrates River, north/central Turkey, and south Turkey, similar to the groupings identified by Emberling and Minc (2016) in their analysis of late fourth-millennium BC pottery.

Rise and fall of the Uruk 'world system'

By 3200 BC, at the end of the Late Uruk period (Uruk IVa), Uruk covered 250 ha in area, a city dominated by cultic precincts with monumental architecture, above all the Eanna precinct covering 8–9 ha in area (Nissen 2002; Eichmann 2007). A major factor in Uruk's development was its role as a cultic centre, with power exercised through temple priesthoods (Algaze 2013). The success of the Uruk model of socio-political complexity is manifest in the export of this template into other regions; in Syria at Habuba Kabira and Jebel Aruda, in southwest Iran at Susa and at other sites in the broader Uruk world (Rothman 2001). Underpinning this expansion was a network of engagement enabling the import into Lower Mesopotamia of metals, stones, animals, timber and slaves.

The collapse of the Uruk 'world system' was at least as rapid as its expansion (Algaze 1993). At approximately 3100 BC Uruk colonies on the Syrian Euphrates were abandoned and Susa's cultural connections switched eastwards towards the Iranian Proto-Elamite world (Potts 2016) while Uruk itself was subject to a major episode of urban restructuring in the Uruk III phase. The causes of this episode

are likely to comprise a combination of peripheral disruption and internal crisis, brought to a head by drier, colder conditions at the end of the mid-Holocene wet optimum (Sharifi et al. 2015). The cities of Lower Mesopotamia faced new challenges in sustaining their individual identities as residences of patron deities and their collective identity as bearers of proto-literate urban Mesopotamian civilization. Uruk's success in this regard is vividly attested by its expansion to an area of 600 ha by 2800 BC, as measured by the area enclosed within the newly built city wall (Nissen 2002, Figure 1). But the socio-cultural processes by which Uruk grew spectacularly in area between 3100 and 2800 BC are poorly understood due to lack of archaeological investigation of appropriate levels at the site. What is clear is that the major cultic focal area of Uruk, the Eanna precinct, underwent a dramatic and complete reorganization in the decades around 3100–3000 BC involving careful dismantling of the massive Late Uruk buildings down to a height of 50 cm, packing of the remaining building plans with rubble and imported rubbish (which contained most of the excavated proto-cuneiform tablets from Uruk), construction of a massive central platform designed to support a temple which may never have been built, and construction of a series of multi-room structures more modest in nature than their Late Uruk precursors (Nissen 2002, Figures 2–3). It is exclusively during this period of disruption and retrenchment, 3100–2750 BC, that we have the material which is our focus here: the city seal evidence.

The Mesopotamian city seal evidence, 3100–2750 BC

The city seal evidence occurs in two sequential pulses (Figure 1; Table 1). The evidence comprises seal impressions on clay tablets and on clay sealings, but no actual city seals have been found. The first pulse occurs coincident with the collapse of the Uruk network at 3100 BC, the Uruk III phase, comprising material from Jemdet Nasr, Uruk and probably Uqair. The second pulse occurs during the Early Dynastic I period, 2900–2750 BC, consisting of artefacts from Ur, Fara and an outlier in southeast Iran.

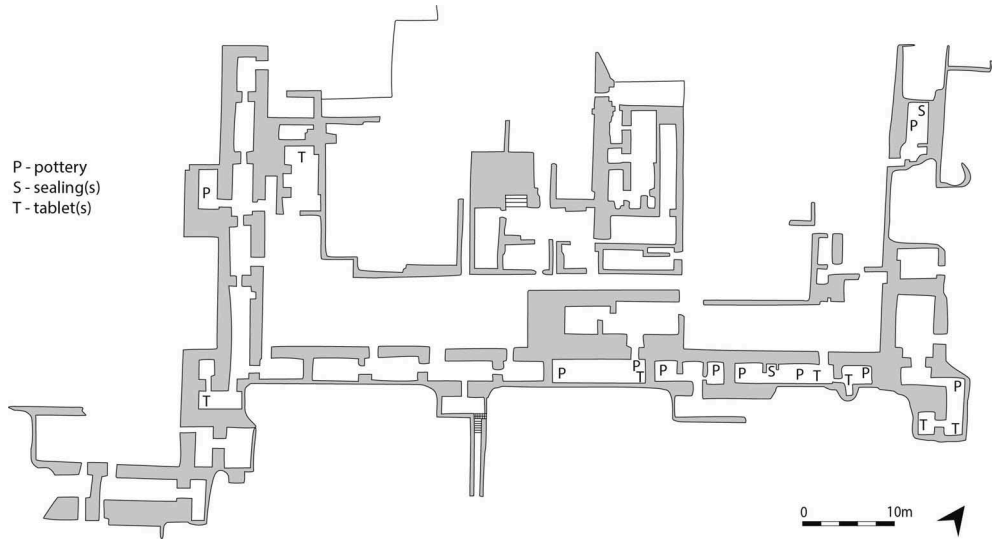

Figure 2. Plan of Jemdet Nasr large building (after Englund [1998, fig. 3]).

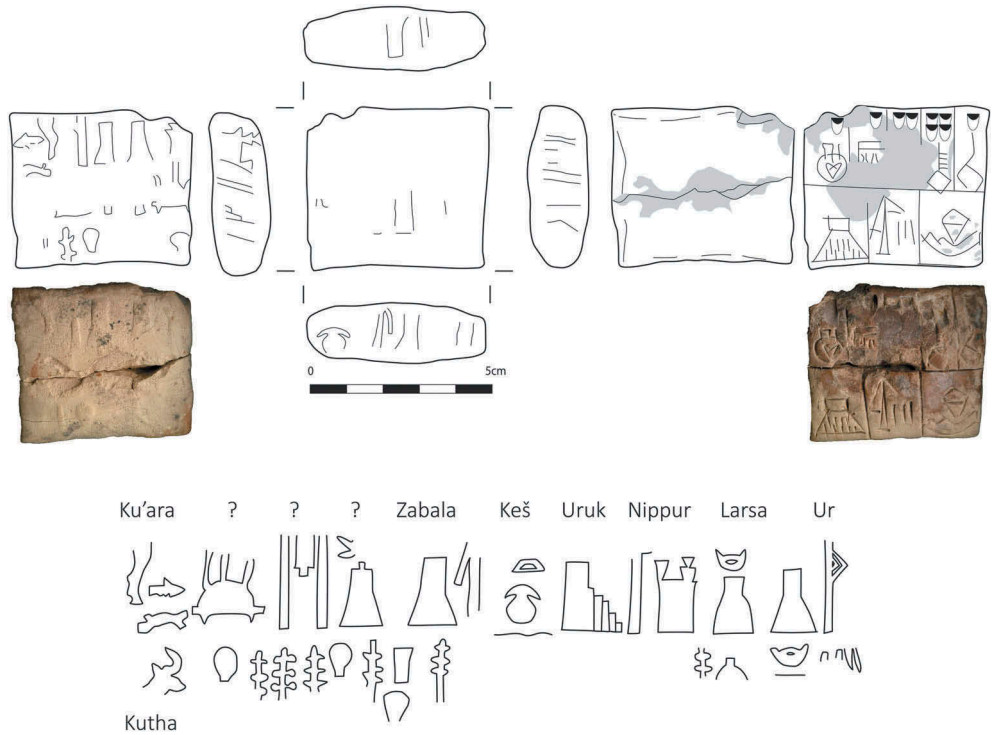

Figure 3. Jemdet Nasr city sealed tablet (after Englund and Grégoire [1991, no. 163, Ashm. 1926.608, © Ashmolean Museum, University of Oxford]) and city seal impression (after Matthews [1993, 37]).

Uruk III phase

Jemdet Nasr

Excavators of Jemdet Nasr recovered 243 proto-cuneiform tablets from a large building (Figure 2; Matthews 2002). The tablets record administrative activities, including control over animals and human labourers, and distribution of grain, dairy products and textiles. Eighty-one of the tablets have cylinder seal impressions, 13 of which are from a city seal (Figure 3) containing the following sequence of city names:

Top register:
Ur, Larsa, Nippur, Uruk, Keš, Zabala, ?, ?, ? Ku'ara
Bottom register:
?, ?, ?, - - -, ?, ?, ?, Kutha (?)

The correlation of ancient names with modern archaeological sites is widely accepted as follows:

Ur = Tell Al-Muqayyar
Larsa = Tell Es-Senkereh
Nippur = Niffar
Uruk = Warka
Keš = Tell Al-Wilayah (?)
Zabala = Ibzaikh

Ku'ara = Uqair (?)
Kutha = Tell Ibrahim

The city sealed tablets at Jemdet Nasr are made up of lists of dried apples and figs, grape products and fish (Englund and Grégoire 1991). Each of the city sealed tablets has a series of signs including NI_a+RU and $UNUG_a$. While $UNUG_a$ can be understood to signify the city of Uruk, the combination NI_a+RU may represent the ancient name of Jemdet Nasr (Englund 1998, 197). It is notable that the proto-cuneiform signs rolled by the city seal on the tablets' surfaces, where they are not symmetrical about a vertical axis, are facing the 'wrong' way when compared to similar signs inscribed by styli onto contemporary clay tablets. This attribute indicates a concern by the seal cutter or seal commissioner to render most legible the signs as cut into the surface of the seal itself (the seal impression naturally showing a mirror impression of the seal's image), emphasizing the situation of the city seals on a transitional boundary between glyptic iconography and early writing. By contrast, inscribed seals from later Mesopotamian periods were cut as mirror images on the seal surfaces so as to have the correct orientation on the impressions rolled on tablet and sealing faces (Collon 1987, 105).

Using pXRF we characterised the elemental composition of 115 clay tablets from Jemdet Nasr, including seven of the 13 tablets bearing the city seal impression. The results indicate a homogeneous composition of the clays used in sealed and unsealed tablets in this assemblage (Figure 4). Considered in combination with the palaeography and content, the geochemical results support the interpretation that the tablets belong to a single, local archive produced in a narrow chronological period. Discriminant analysis of the clay composition of seven tablets impressed with the city seal demonstrates a tight cluster within the range of the overall tablet assemblage, suggesting that the seal may have been used in a single sealing event at a single location, Jemdet Nasr itself.

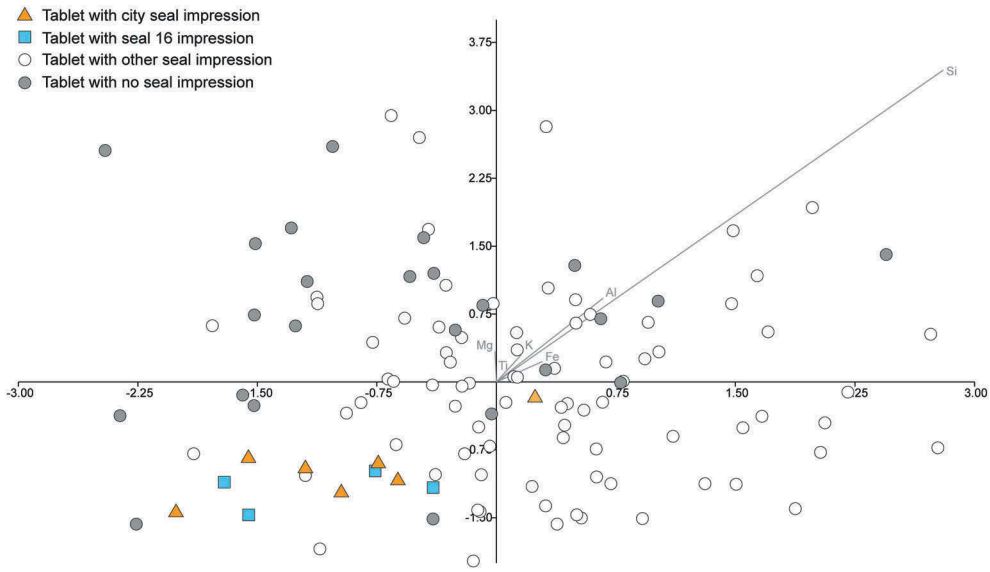

Figure 4. Discriminant analysis of calibrated pXRF data from Jemdet Nasr.

Uqair (?)

In addition to the 13 Jemdet Nasr tablets bearing city seal impressions, we consider a tablet of unverified provenance, one of a group purchased in 1903 by the Berlin Pergamon Museum (Figure 5; Falkenstein 1936, nos 621–56). This tablet is remarkable in bearing the same city seal impression as the Jemdet Nasr examples discussed earlier. Did this tablet originate from Jemdet Nasr prior to the 1920s excavations there, as Falkenstein assumed?

The Berlin city sealed tablet lists commodities differing slightly from the Jemdet Nasr tablets, including dried fruits, fish and vegetables, as listed in the Jemdet Nasr texts, plus items measured in 'jars' (DUG). The Berlin tablet text ends with a variation from the Jemdet Nasr examples. Most striking is the sign group KU_{6a} RAD_a UR_2 in the same location where NI_a+RU occurs on the Jemdet Nasr city sealed tablets. If NI_a+RU equals the ancient name of Jemdet Nasr, might KU_{6a} RAD_a UR_2 represent the name of another Mesopotamian city? Green (1986, 79) suggested that, as more than half the 38 Berlin tablets purchased in 1903 have the sign combination KU_{6a} RAD_a UR_2, a combination also found on four proto-cuneiform tablets excavated at Uqair, 15 km northwest of Jemdet Nasr, the Berlin collection probably originated from Uqair rather than Jemdet Nasr. Green's suggestion is significant, as it is extremely rare in ancient Mesopotamia for impressions of the same seal to be found at more than one city.

Discriminant analysis of the compositional pXRF data shows that the Berlin city sealed tablet more closely shares a geochemistry with the 37 other Berlin tablets (Figure 6). This group is distinct from the clays of the tablets excavated at Jemdet Nasr, supporting Green's argument for a separate source. Our analysis appears to establish the movement of the seal, for use in at least two cities, one of which is Jemdet Nasr and the other is likely to have been Uqair. We return to this point in our interpretation section later.

Figure 5. Photo of Uqair city-sealed tablet, © Staatliche Museen zu Berlin - Vorderasiatisches Museum, Foto: Olaf M. Te?ner 3/2019 VAT 5296.

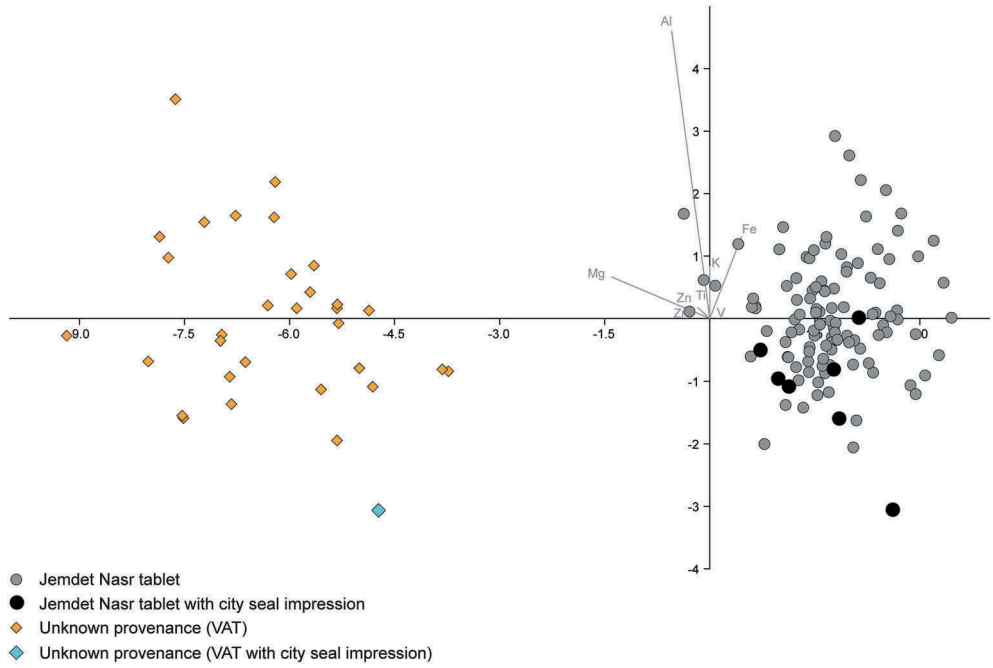

Figure 6. Discriminant analysis comparing calibrated pXRF data for tablets from Jemdet Nasr and Uqair (?).

Uruk

There is only one convincing city seal example from Uruk, a large clay sealing (Figure 7; Matthews 1993, Figure 10(b)). Our new drawing of this seal impression enables the following reading:

Top register:
Ur, Nippur, Larsa, Uruk, Keš, ?, ?
Bottom register:
?, edinnu?, ?, ?

The inclusion of Ur, represented by a ligature of URI_3 + AB (= URI_5), confirms the uniformity of city name sequence attested on all the Uruk III-phase city seal evidence. The fact that the Uruk city seal impression occurs on a door sealing indicates that it relates to the storage of commodities within sealed store-rooms at Uruk itself. The clay of the Uruk sealing is characteristic of door and pot sealings from Uruk, comparable with Uruk pottery analysed by Daszkiewicz, van Ess, and Schneider (2012). Within the homogeneity, our study demonstrates that differentiation can be discerned not only between cities, but also between clay types used for different functions. Discriminant analysis highlights a higher proportion of calcium present in the clays used for sealing pots as opposed to doors (Figure 8). Conversely, door sealings are represented by higher silica content due to the sandy clays from which they were commonly made. The variability in this small sample may relate to the movement into Uruk of goods in sealed containers coming from outside the city.

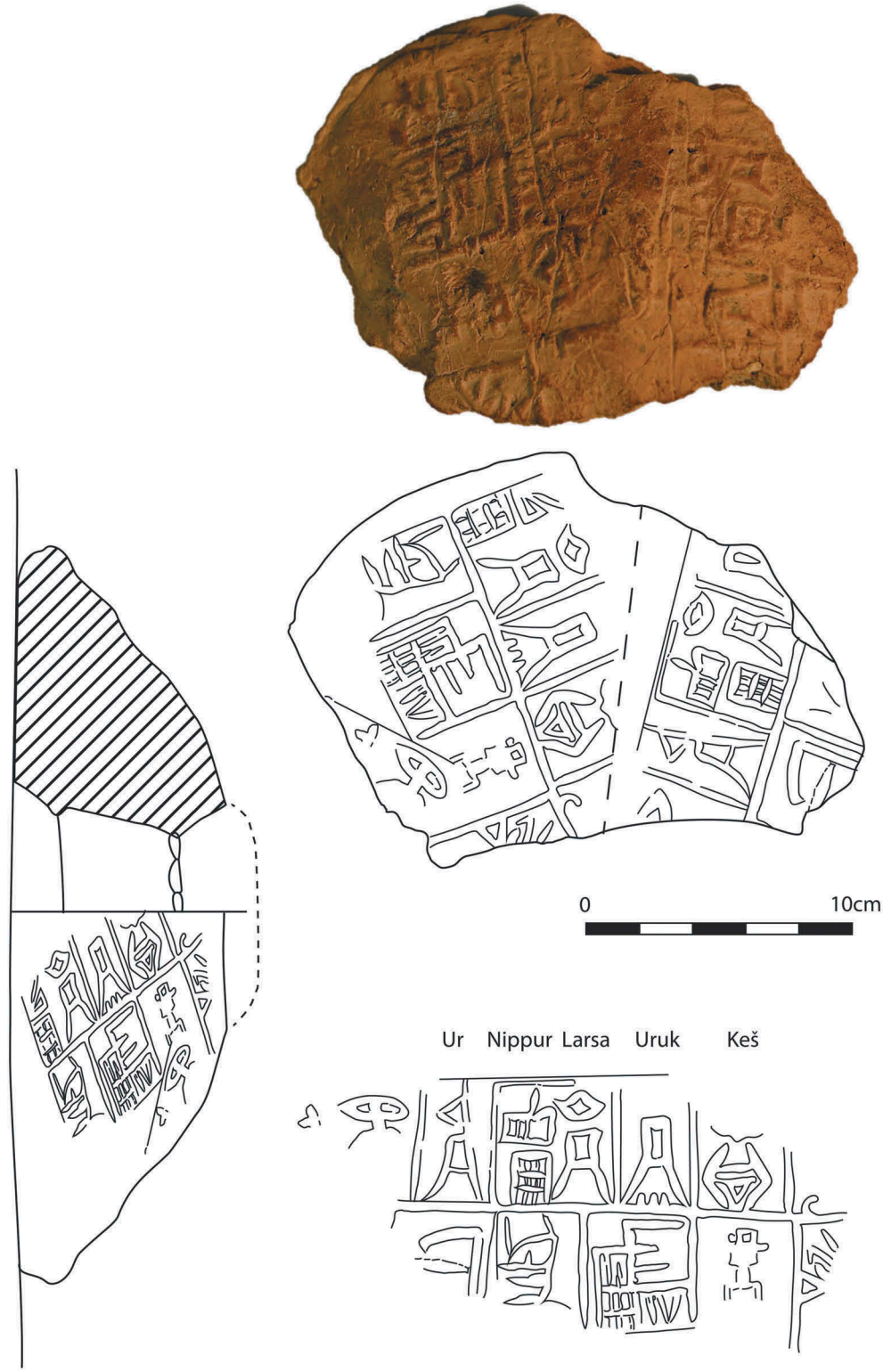

Figure 7. Uruk clay sealing with city seal impression, W 11,456/VA10803.

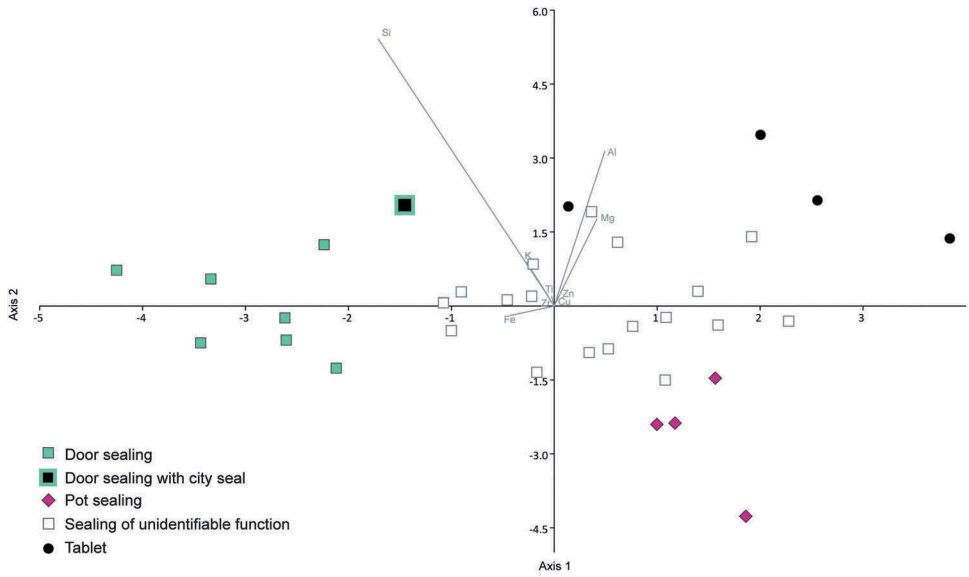

Figure 8. Discriminant analysis of calibrated pXRF data from Uruk according to sealing function.

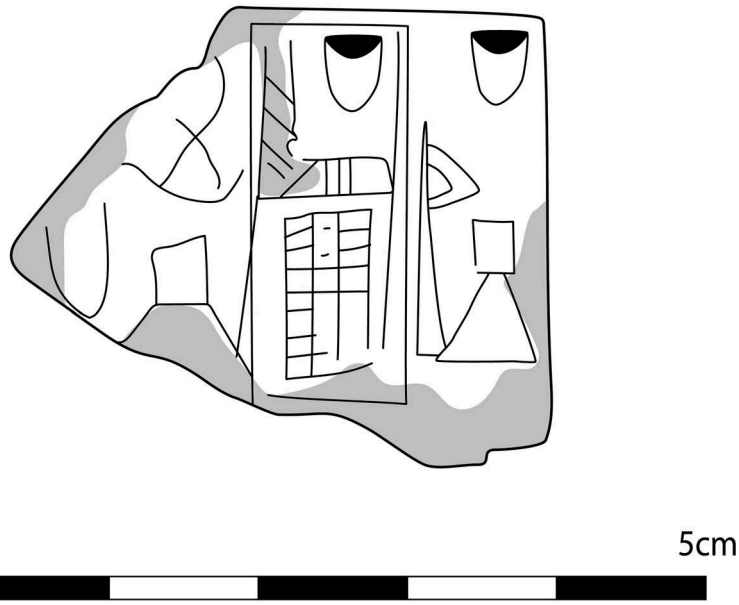

Figure 9. Archaic city list tablet, W 21,126 (after Englund and Nissen [1993, Abb. 16]).

Summary of the Uruk III city seal evidence

An important document for understanding the city seals is the proto-cuneiform archaic city list (Figure 9; Englund and Nissen 1993). At least 88 cities feature in this document, which is likely to have had cultic significance. We can reconstruct the first entries of the archaic city list as:

Ur, Nippur, Larsa, Uruk, Keš, Zabalam, Ereš, Gaburra, UR_2 RAD_a KU_{6a} ., ., ., ., BU_a+BU_a+NA_{2a}.

The Uruk III city seal evidence is summarized in Table 1. Across these sources from the northern and southern limits of Lower Mesopotamia the city sequences are almost identical for the first five-six entries, the only exception being the alternating of Nippur and Larsa in the Jemdet Nasr seal impression. It is remarkable that these two cities are the only ones included in the same linear box on the Uruk sealing, suggesting inter-changeability between them or their patron deities.

Early Dynastic I phase

Ur

Table 3 summarizes the cities attested on the Ur city sealings (Matthews 1993). A total of 80 clay sealings from Ur in the British Museum were analysed with pXRF, all of them bearing pictographic signs either representing city names or of unclear meaning. Differentiation between clays occurs not between the iconography of the seals rolled on the clay sealings but according to sealing function (Figure 10). The sealings bearing clear city names belong exclusively to the door sealings, where identifiable, which share characteristics with clays used for sealing pots and test strips. However, the clays used for sealing some portable goods, particularly those used to seal reed matting packages, vary more significantly in their composition, which may be indicative of the import of portable commodities from beyond the cultic precincts, as at Uruk, but these container sealings tend to bear seal impressions with pictographic signs that cannot confidently be associated with known city names.

Table 3. City identifications in Ur city seal impressions (Matthews 1993, U1–U23).

No.	Ur	Nippur	Larsa	Uruk	Kesh	Adab	Eridu	UB	UR_2/?Dēr	Edinnu
1										?
2		?			?					
3		?				?				
4				?						
5										?
6										
7										
8										
9						?				
10										
11										
12										
13										
14	?								?	
15										
16										
17	?									?
18				?	?					
19				?						
20										
21	?			?						
22				?						
23		?								

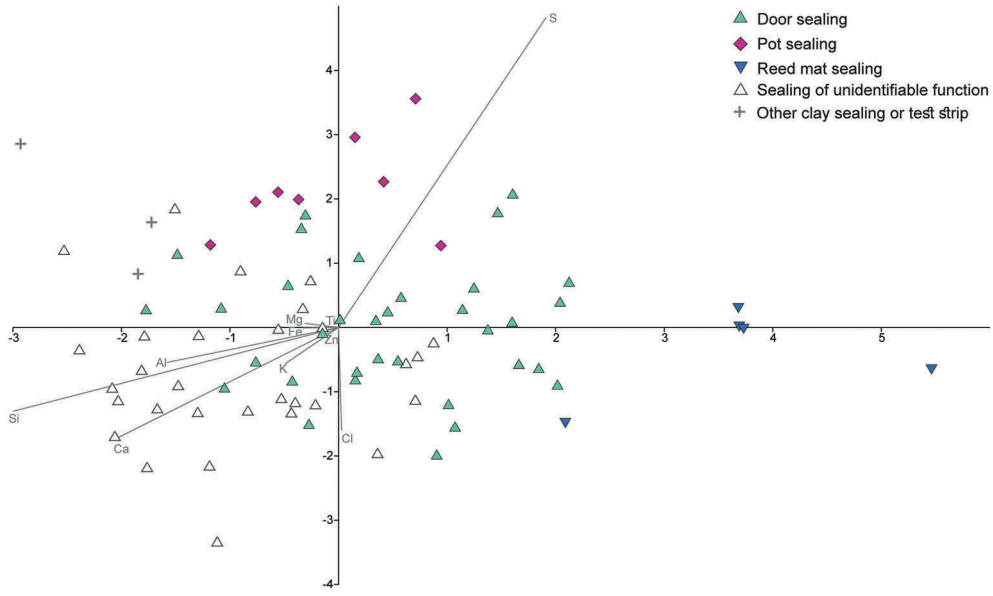

Figure 10. Discriminant analysis of calibrated pXRF data from Ur according to sealing function.

Figure 11. Early Dynastic I city seal impression from Fara, VA6361 (after Martin [1988, no. 131], with authors' additions).

Fara

Only one seal impression from Fara bears proto-cuneiform signs comparable to the Ur sealings (Figure 11; Martin 1988, no. 131). This impression occurs on 13 clay sealings excavated from a rubbish dump of Early Dynastic I date. Analogous to sealings from Ur, we interpret the Fara sealings as being deposited in the dump during clearings of debris from a building with administrative functions.

The symbols on the Fara seal impression include possible representations of Eridu (NUN_a), Ur ($?URI_{3a}$ $?AB_a$) and Keš ($?DUG_3+$). The sealings include six door peg sealings and seven of indeterminate function (Figure 12;

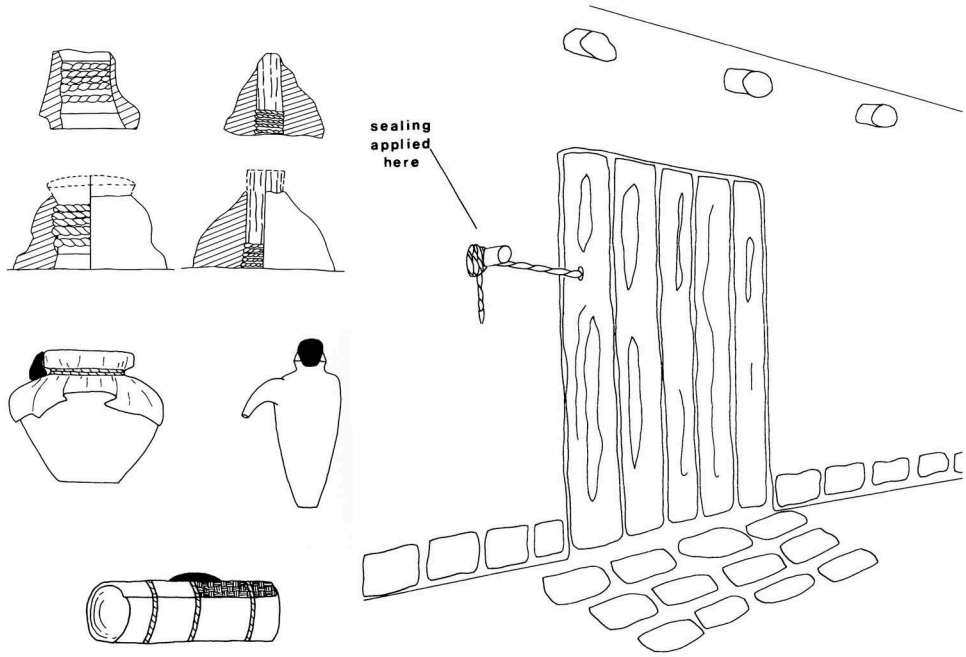

Figure 12. Function of Fara door and container sealings (after Matthews [1991, Figure 2]).

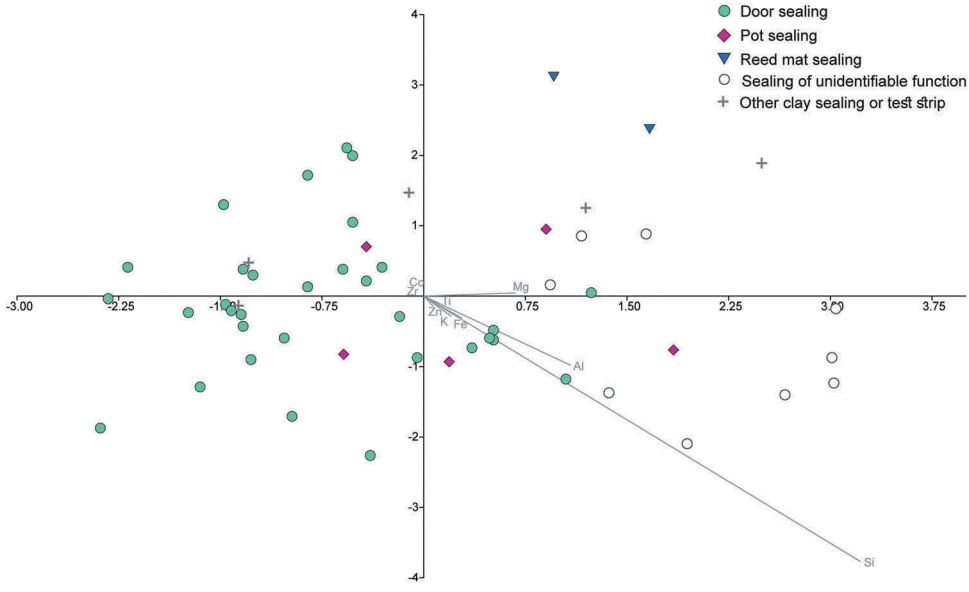

Figure 13. Discriminant analysis of calibrated pXRF data from Fara according to sealing function.

Matthews 1991). Compositionally, the Fara sealings comprise a uniform body of material with minor variations in the overall composition according to sealing function, with reed mat package sealings once more distinctive (Figure 13).

Konar Sandal South

One of the most intriguing discoveries in city seal research comes from a site in southeast Iran, Konar Sandal South (Madjidzadeh and Pittman 2008, fig. 32e). This seal impression occurs on the only door sealing found at the site. We provide an annotated drawing of the seal impression with tentative readings (Figure 14). On the left we propose a ligature of URI_3+ AB (= URI_5) = Ur, while in the centre we have a plausible 'edinnu' sign. There is a possible lower half of a KID_a sign, possibly representing part of the city name of Nippur, and there may be an $UNUG_a$ sign representing Uruk. In order of decreasing confidence, we read this impression as potentially including the following cities, all of which feature on the Ur sealings: Ur, edinnu, Nippur, Uruk.

Identification of Ur on this seal impression is significant given the distance (1250 km directly) between Konar Sandal South and Ur. Dated to 2900 BC, this sealing suggests the engagement of Ur with the east well before the Early Dynastic III period, when grave goods from the Royal Tombs of Ur indicate eastern connections through the import of gold, silver, lapis lazuli and carnelian.

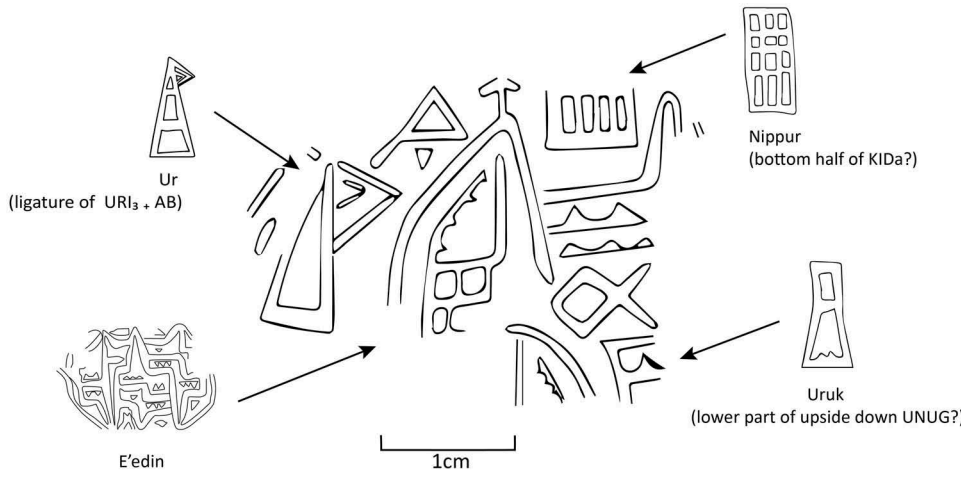

Figure 14. Konar Sandal South city seal impression, KSS2008XJV002, with tentative city name readings (after Madjidzadeh and Pittman [2008, fig. 32e], with authors' additions).

Summary of the Early Dynastic I city seal evidence

The city of Ur dominates the Early Dynastic I city seal evidence, both as a provenance for the only substantial assemblage of city seal material and as a city attested most widely including in the evidence from Konar Sandal South (Table 1). The Early Dynastic I city seal evidence consists exclusively of door sealings with seal impressions, with no evidence for city seal impressions on inscribed tablets of this date which are rare outside Ur.

Understanding the city seal evidence: previous approaches

Jacobsen (1957, 109) proposed that the city seal impressions related to 'official deliveries to Ur by groups of cities, a feature most easily understandable in terms of a league of cities'. This essentially economic interpretation was followed by most scholars (Wright 1969; Moorey 1976; Nissen 1988; Steinkeller 1993). Conversely, we noted that the commodities listed in the Jemdet Nasr tablets were 'in such small quantities that some symbolic, perhaps religious, factor is involved' (Matthews 1993, 49). Szarzyńska (1993) explored the cultic contexts of proto-cuneiform administration at Uruk, proposing that three versions of the goddess Inana are attested in the Uruk texts: morning, evening and princely Inana. Building on the work of Szarzyńska, Matthews (1993) and others, Steinkeller (2002a, 2002b) looked at the sequence of signs ending the Jemdet Nasr and Berlin city sealed tablets. He proposed that the sequence $3N_{57}$ $MUŠ_{3a}$; $UNUG_a$ should be read as 'triple Inanna/deity of Uruk', which could be equated with Szarzyńska's three forms of Inana. In Steinkeller's (2002a, 254) interpretation, the city sealed texts take the form of: 'x commodities (issued by) the city of NI.RU (= ancient Jemdet Nasr?) for the triple Inanna/deity of Uruk'.

Steinkeller (2002a, 255–56) envisaged the city seal as belonging to a collector of offerings for Inana of Uruk, representing 'some supra city-state institution' spanning Lower Mesopotamia, who

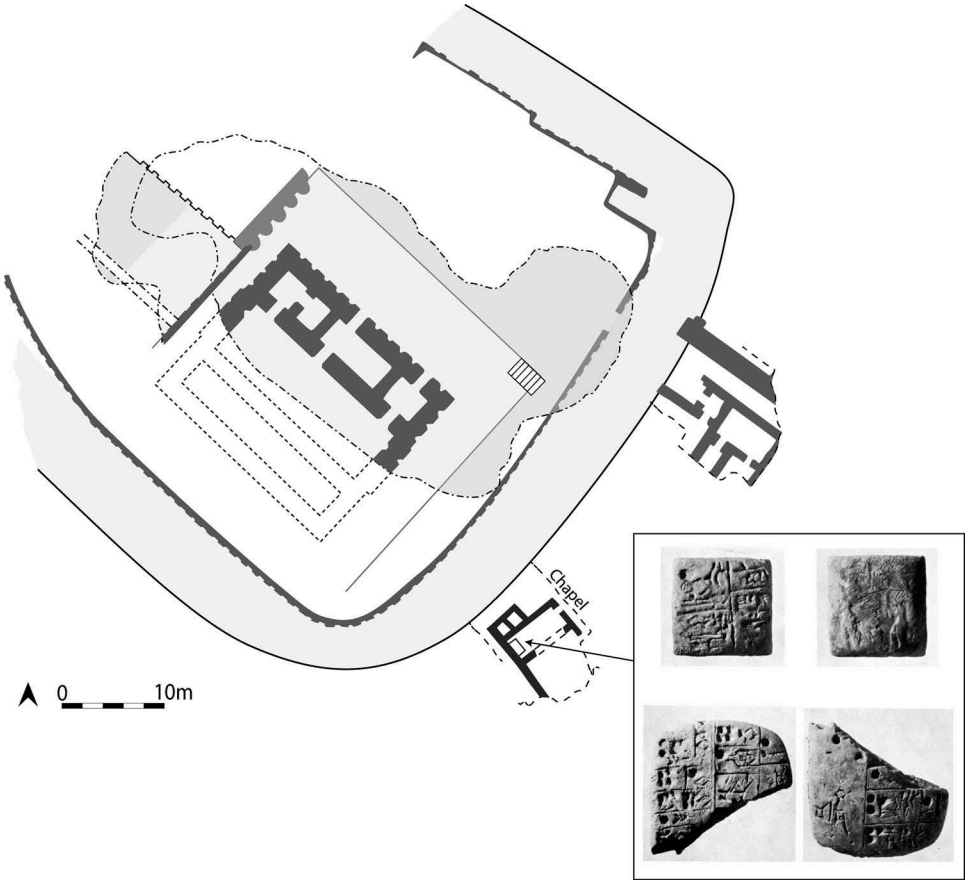

Figure 15. Findspots of Uqair tablets (after Englund [1998, Figure 4]; Lloyd and Safar [1943, pl. 31], with authors' additions).

'traveled to NI.RU and Urum, collected the offerings for Inanna, and left behind receipts sealed with his official seal'. We propose here to combine elements of these insights with the results of our integrated analyses in order to generate a fresh interpretation of the city seal evidence.

Early Mesopotamian city seals: new interpretations

The Uruk III phase

Let us begin by returning to Uqair, where excavations recovered four proto-cuneiform tablets in a 'chapel' in Sounding 1, adjacent to the Painted Temple on its platform (Figure 15; Lloyd and Safar 1943). Two of the tablets have seal impressions, critical to developing a new interpretation of the city seals in the Uruk III phase. The seal impression on one tablet (Englund 1996, no. 37) is highly distinctive (Figure 16; Martin 1988, 133). The scene shows a boat with high prow and stern. On the boat a figure with long hair sits inside a canopy, receiving items offered by naked male figures. Other male figures are propelling the boat. We interpret this scene as depicting the traction by a powerful animal of a boat in which a seated female deity, in the form of a cult statue, is being attended to by priests.

A parallel for this scene is provided by a contemporary seal from Uruk (Figure 17; Amiet 1980, pl. 46.655). In the Uruk boat, propelled by two naked priests, a so-called 'priest-king' stands in the centre. Marchesi and Marchetti (2011, 186–96) interpret the 'priest-king' depictions of Uruk IV-III date as representing a male form of the 'goddess' Inana, aligning with Szarzyńska's (1993) characterization of one of the three forms of Inana as 'princely' and with the hermaphroditic nature of Inana (Groneberg 1986).

The seal impression on another Uqair tablet (Englund 1996, no., 38) shows a similar scene (Figure 18), with a seated deity or cult statue within a canopy receiving offerings from naked priests, two of whom are propelling a boat. The two ringed staffs at right are frequently associated with Inana (Black and Green 1992, 97). Given the context in which the Uqair tablets were found (Figure 15), we propose that the chapel served as a visiting place for the cult statue depicted in the seal impressions on the tablets recovered from this same building. The cult statue would have been placed on the rectangular podium at the southwest end of the cella, facing northeast through the entrance. This alignment, which matches that of the two major doorways into the main Uqair temple on the adjacent platform, is likely to have had astronomical significance perhaps relating to the most northerly rising point of Venus, with which Inana was closely identified. The two small rectangular bins to the north of the cella may have served as storage facilities for offerings to the cult statue, as attested on the associated proto-cuneiform tablets.

Later Sumerian literature is rich in narratives of sacred journeys across Mesopotamia by the gods in the form of their cult statues. In the myth of *Inana and Enki* (Alster 1974), Inana visits Enki at Eridu,

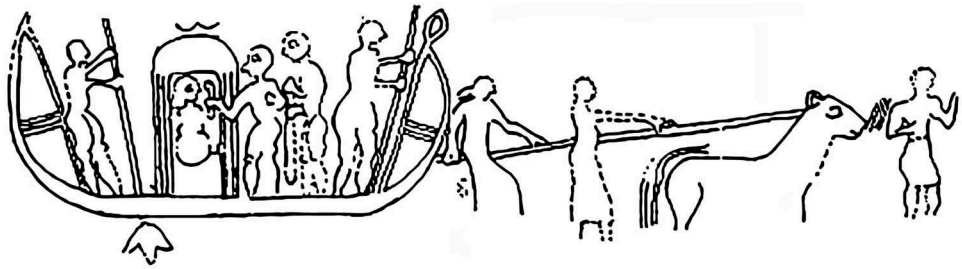

Figure 16. Seal impression on Uqair tablet (after Englund [1996, no. 37]).

Figure 17. Uruk III seal from Uruk (after Amiet [1980, pl. 46.655]).

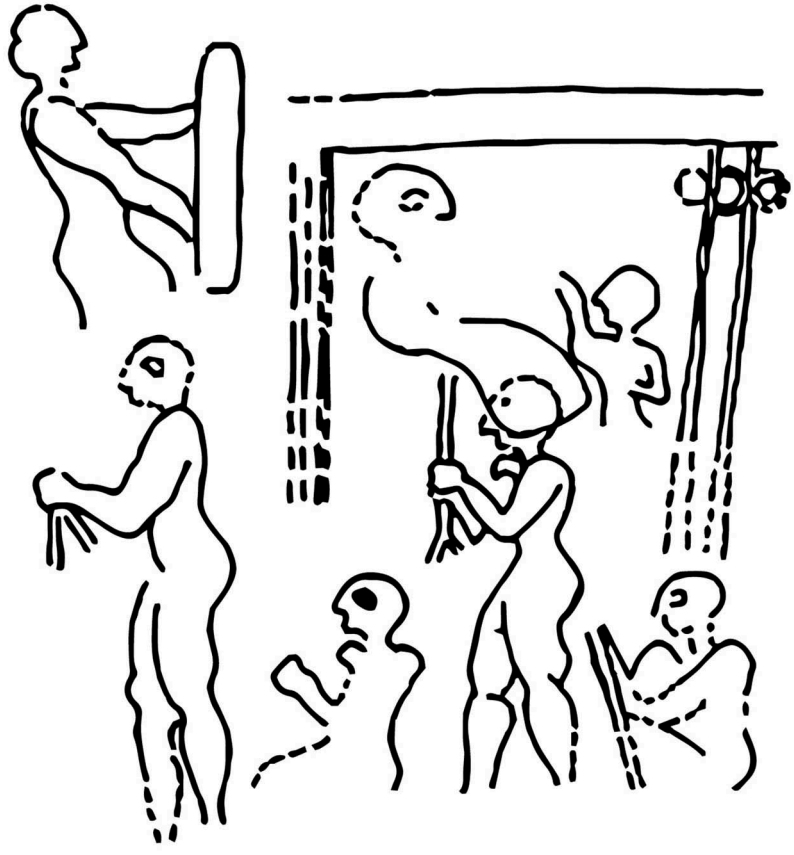

Figure 18. Seal impression on Uqair tablet (after Englund [1996, no. 38]).

travelling in a 'boat of heaven' and possibly mimicking the course across the sky of the planet Venus (Cooley 2008). In the tale *Nanna-Sîn's Journey to Nippur*, Ur's patron deity Nanna, the moon god, travels by barge from Ur to Nippur to receive the blessing of his father Enlil (Black et al. 2004, 147–54). The composition gives a vivid account of the barge's construction (from reeds, rushes, pitch and timbers), the gifts and offerings taken on board and the stages along the six-day journey.

In sum, the archaeological, textual and iconographic evidence allows us to propose a new interpretation of the Uruk III city seal evidence. At specific times during the cultic calendar, cult statues of deities were carried at their host city onto boats and taken on animal-drawn tours of other cities where they were hosted in chapels to receive offerings from local devotees. Each city participated in the cultic endeavour through provision of offerings – fruits, fish, beer – recorded on clay tablets rolled with a city seal. The city seal itself, which could have been one of many such seals each used for specific cultic journeys, would have been the property of the touring deity, accounting for its use at both Jemdet Nasr and Uqair, and returned with them to their home city. We cannot be certain as to the materials of which the city seals were made but contemporary seals from Uruk, Jemdet Nasr, Uqair and other sites were made from a wide range of materials including soft limestones and harder diorites and even rock crystal (Collon 1987, 14–15). The city seal attested by the Jemdet Nasr and Uqair impressions was certainly large, with a diameter of 4.93 cm, a circumference of 15.5 cm and a height of at least 6.0 cm (Matthews 1993, 34).

The visited city would have retained the sealed tablets as a record of their participation in the cultic event, as attested by the tablets found at Jemdet Nasr and Uqair. Steinkeller's proposal that the Jemdet Nasr and Uqair sealed tablets list offerings to three versions of Inana would entail that some of the offerings were conveyed to Uruk for storage and use in future festivals of Inana at Uruk. The city door sealing from Uruk fits well with this interpretation, attesting storage within rooms at Uruk of commodities collected from cities on behalf of Inana.

As at Uqair, each city visited by Inana's statue might host a shrine dedicated to a localized version of Inana, as attested in the second millennium BC case of Ištar at Mari and other locations across Upper Mesopotamia. As Knott (2017, 55) argues, 'localized Ištar goddesses like Eštar Irradan were often invoked to construct and amplify social and political ties across space,' drawing on divine topography to generate trans-city resilience exactly as we envisage here for Inana at *c*.3100 BC. A striking parallel for the Inana city tours proposed here is that of the tours of the Upper Habur region of northeast Syria by the goddess Bēlet-Nagar also during a time of regional retrenchment (Guichard 1994, 269–72). We conclude therefore that 'practices of using goddesses to define territory and construct communities across space' (Knott 2017, 59) served over millennia as a resilience strategy for Mesopotamian urban elites.

The Uruk III-phase city seal impressions may thus attest cultic activities intended to reinforce the supremacy of the cult of Inana and her host city Uruk across Lower Mesopotamia at a time of crisis when Uruk's trans-regional control was dramatically reduced. The barge procession, bearing a cult statue of Inana adorned with precious metals and jewellery (Dick 2005), seated within a canopied barge drawn by large animals and accompanied by priests, attendants and herds of animals, would have been an awesome sight as it traversed the Mesopotamian waterways, visible for miles. We interpret these inter-city cultic processions and the attendant paraphernalia including the city seal and the offering tablets as elements of a resilience strategy pursued by the priesthood of the Eanna precinct in an attempt to sustain the city's and its cult's dominance in the face of a changing world.

The Early Dynastic I phase

For the Ur sealings, it is likelier that they are concerned with sets of offerings, over a period of years or decades, made by individual cities or groups of cities, to a major deity at Ur, doubtless the moon god Nanna (or Nanna-Sîn) (Black and Green 1992, 135; Charvát 2017). This attribution is underlined by the fact that some 140 of the 330 Early Dynastic I Sumerian texts from Ur, found in the same Seal

Impression Strata (SIS 4–8) as almost all the city sealings, constitute an archive from the Nanna temple at Ur, which includes mention of both a king (*lugal*) of Lagaš and a palace (E_2.GAL), the earliest textual references in Mesopotamia for both king and palace (Sallaberger 2010; Lecompte 2013, 2016). Also commonly cited in the Ur texts is the sign AB, understood by Sallaberger (2010, 33) to refer to a 'royal precinct' where the king resided and held office. These Ur documents sit on the very cusp of a shift in the balance of socio-political power from sacred to secular, which proceeds apace through the rest of the third millennium BC and is manifest in the construction of the earliest royal palaces at several Mesopotamian cities by 2500 BC (Matthews and Matthews 2017). As the secular power becomes dominant, from *c*.2750 BC, the cultic framework for inter-city cooperation and negotiation is co-opted into a narrative of royal achievement, where the old cultic traditions now 'helped to aestheticize and ritualize the public lives of the ruler and elites' (Black et al. 2004, 113). At the same time, we can trace a shift from nucleated political authority as attested at Uruk in the Uruk IV-III phases, to a more distributed model of polycentric power by the Early Dynastic I phase, accompanying the rise to power of multiple competing city-states across the Lower Mesopotamian floodplain through the early third millennium BC (Van De Mieroop 2002).

For the Early Dynastic I Ur SIS sealings, we have little hint as to what precise offerings or commodities were being sealed in the containers (jars, boxes, bales) and store-rooms attested by the sealings' reverse markings. We can at least surmise that some of the Ur offerings were liquids, oils or fats in sealed vessels while others were solid commodities such as semi-precious stones, textiles or hides sealed in boxes and bales. The fact that commodities were also stored within rooms, secured by sealed door-pegs, suggests that specific commodities could be accumulated, stored and disbursed from within dedicated store-rooms, doubtless located adjacent to temple precincts at Ur (Charvát 2017). The preponderance of door sealings in the Ur city sealing corpus (Matthews 1993, 44; Benati 2015) suggests less mobility in the city seal engagement, compared to the earlier Uruk III evidence.

More broadly, the glyptic evidence from the Ur SIS shows a consistent iconography that bears little resemblance to that of the preceding Uruk IV-III periods, suggesting a significant break in tradition with earlier administrative iconography. As Charvát (2012, 83–84) has demonstrated, only two of the hundreds of different designs attested in the Ur SIS assemblages show iconographic continuity from Uruk IV-III motifs. Moreover, Charvát points out that the designs and motifs of the Ur SIS glyptic find their best parallels to the east, in the painted pottery and seal designs of Susa and other Iranian sites. This observation sits well with our new identification of the name of Ur on the Konar Sandal South seal impression.

The end of the city seal evidence

After 2750 BC we have no evidence for the use of seals bearing names of multiple Mesopotamian cities. There is ample evidence for ongoing inter-city interactions across a spectrum of socio-political and cultic behaviours, but the specific type of evidence we are concerned with here ceases. Evidence for later inter-city engagement includes Early Dynastic III texts from Fara concerning up to 6580 workers from cities across the Mesopotamian floodplain, including Fara itself plus Uruk, Adab, Nippur, Lagash, Umma and Kish (Martin 1988, 93), as well as the Early Dynastic III practice of cities providing offerings to the Ekur, the temple at Nippur of Enlil, the paramount Sumerian deity (Zettler 1996).

The cessation of the city seal evidence presages a shift in the socio-political landscape of Mesopotamia. From 2600 BC city-states intensified their engagement with the world beyond Lower

Mesopotamia, augmenting their imports from the resource-rich zones to the east and north (Van De Mieroop 2002). Their increasingly powerful elites, kings and queens living in palaces and requiring elaborate burial after death, demanded the import of commodities such as gold, silver, lapis lazuli and carnelian, as well as timber, equids and slaves, all attested in texts from the Early Dynastic III period and epitomized in the tombs of the Royal Cemetery of Ur (Zettler and Horne 1998). The use of human sacrifice in this cemetery indicates attempts by elites to demonstrate power through their capacity to bury lovingly accumulated societal wealth, including precious artefacts, animals and people. A cross-cultural study (Watts et al. 2016) of societies practising human sacrifice finds a strong correlation between the practice of sacrifice and increasing social stratification including transition to inherited class systems such as royal dynasties, as we envisage for Early Dynastic III Ur.

We argue that the city seal evidence affords us unique insights into the modes of inter-city cooperation by Mesopotamian cities during a critical episode of retrenchment, 3100–2750 BC. Cooperation was manifest in collaborative cultic practice materialized in the Uruk III phase through boat journeys of the gods in which groups of cities acted together to sustain prosperity of the gods, their shrines, their cities and their peoples, and in the Early Dynastic I phase by provision of offerings to shrines of major deities at key cities such as Ur and Fara, at least. The extent to which this proposed cultic collaboration across the Lower Mesopotamian floodplain was underpinned by a network of economic engagement involving movement of commodities between cities according to each city's requirements and productive capabilities is not fully clear. But Jacobsen's (1970, 1976) pioneering categorization of Mesopotamian deities according to the environmental settings of their host cities – southeastern marshes, southern orchards, herding regions and farming regions – articulates a geographical framework for understanding how such networks might have operated while our new reading here of the city seal evidence for the first time connects shared cultic behaviour with such an economic pattern of inter-city commodity exchange. It is furthermore striking in this context that Jacobsen (1970, 27) characterizes Inana of Uruk specifically as a deity 'of the storehouse'. The success of this strategy of societal resilience can be measured through the longevity and vitality of Mesopotamian cities and attendant modes of living through subsequent centuries. Through rigorous application of an innovative methodology integrating pXRF analysis of bureaucratic clays with functional and iconographic interpretation of clay sealings, seal impressions and proto-cuneiform tablets, situated within the theoretical framework of cultic resilience, our study of the city seal evidence shines new light on the modalities of interaction amongst the world's earliest protohistoric urban communities.

Acknowledgments

We thank the following: at the Vorderasiatisches Museum, Berlin: Prof Dr Markus Hilgert, Director, and Dr Lutz Martin, Deputy Director, for access to materials from Fara, Uruk and Uqair; at the Ashmolean Museum, Oxford: Dr Paul Collins, Jaleh Hearn Curator for the Ancient Near East, for access to materials from Jemdet Nasr; at the British Museum, London: Sarah Collins and colleagues in the Science Department for access to materials from Ur and Jemdet Nasr; at the University of Reading: Dr Stuart Black and Marie Taylor for technical support; and at the German Archaeological Institute: Prof Dr Margarete van Ess for assistance with access to materials from Uruk. We are also grateful for helpful comments from two anonymous referees.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the Research Committee of the School of Archaeology, Geography and Environmental Science, University of Reading.

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